Sd. FRENCH VIEW.
Panification.
2775-1859
6581

FIG. 1.

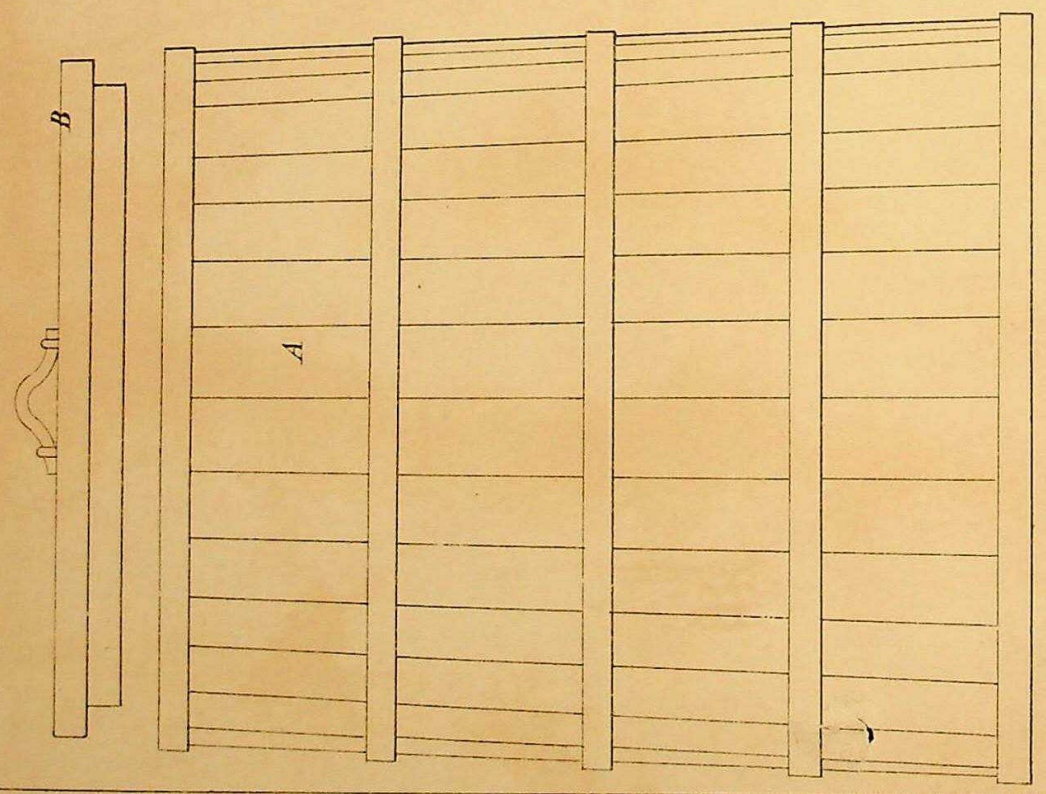


FIG. 2.

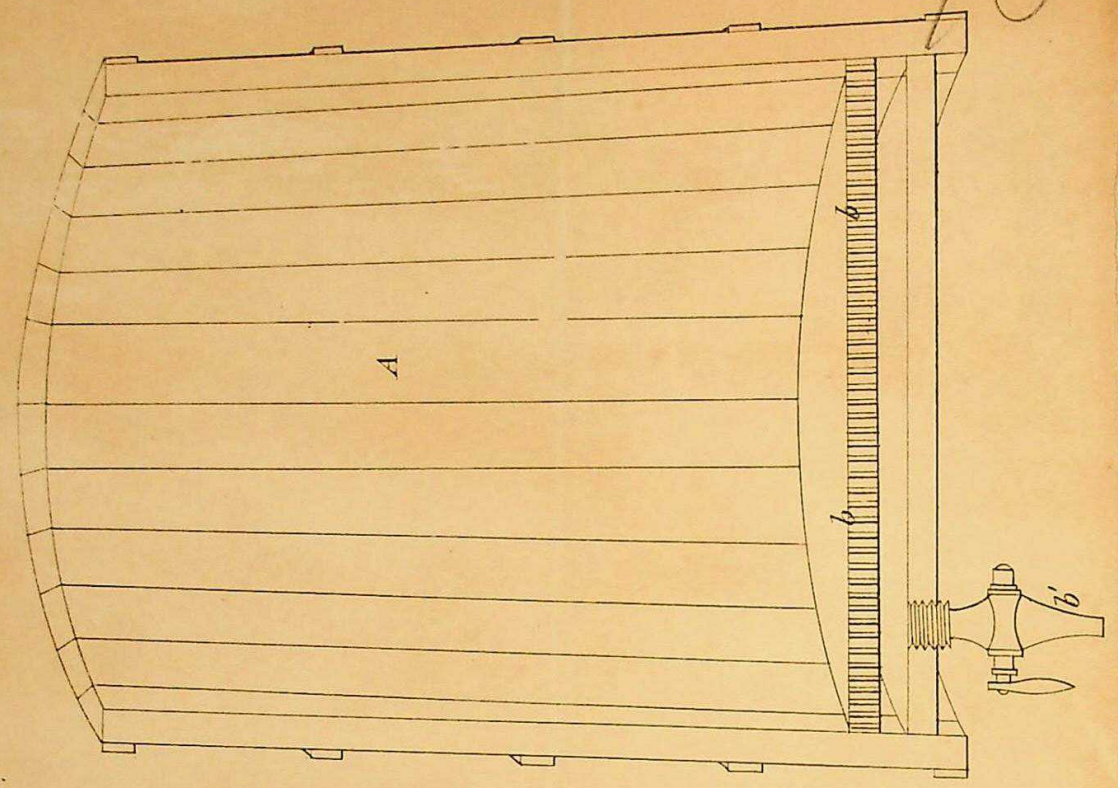


FIG. 3.

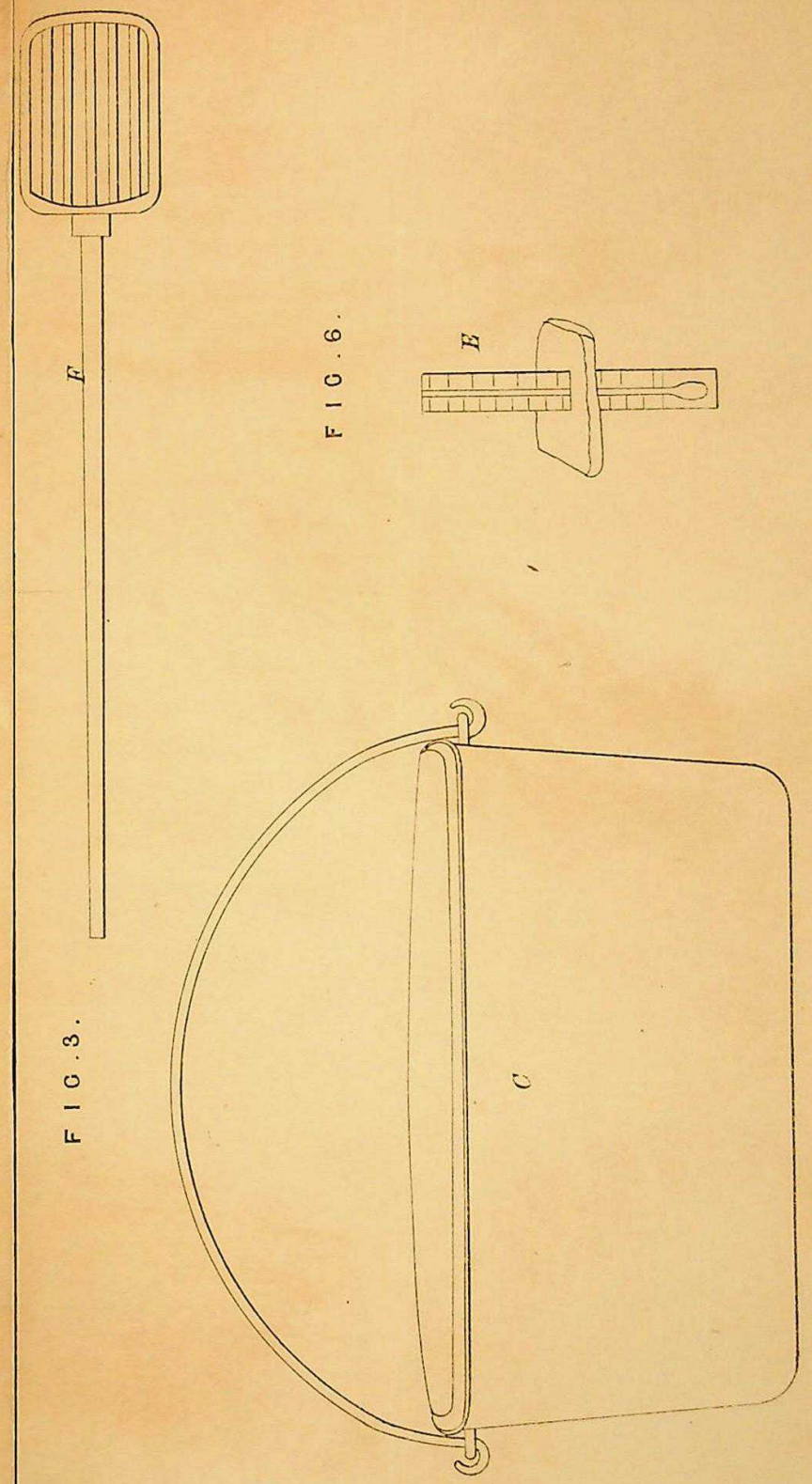


FIG. 6.

A. D. 1859, Dec. 7. N° 2775.
SIMONET DE CHANGY'S Provisional Specification.

99. PRESERVING
Panification.

FIG. 4.

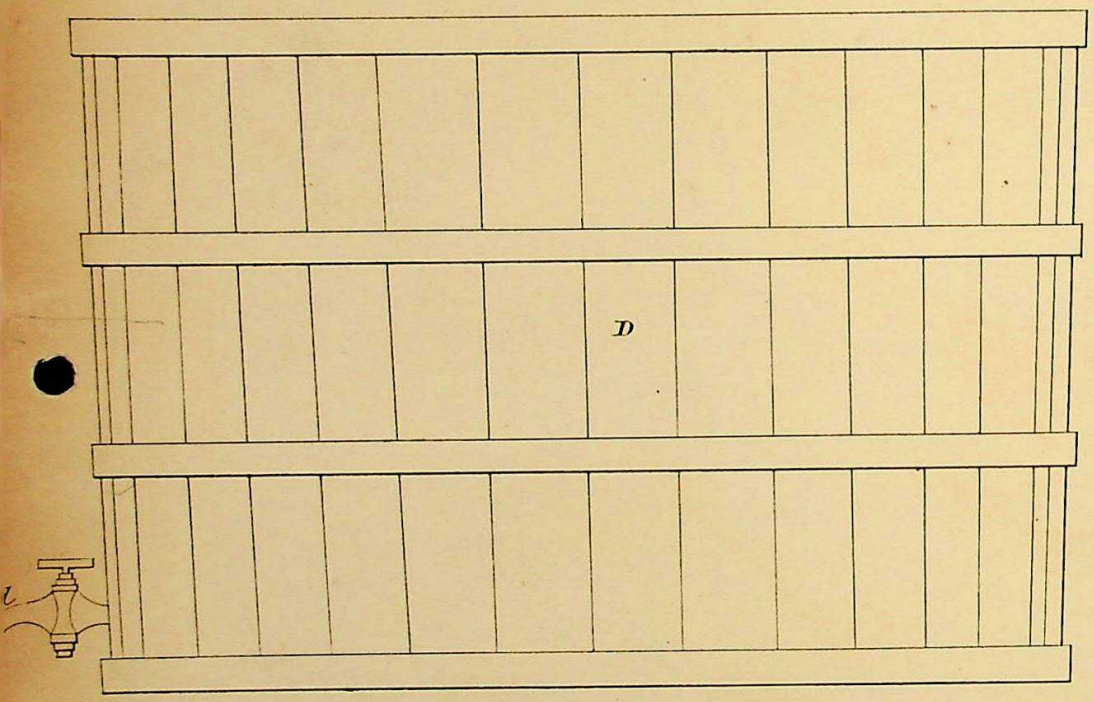
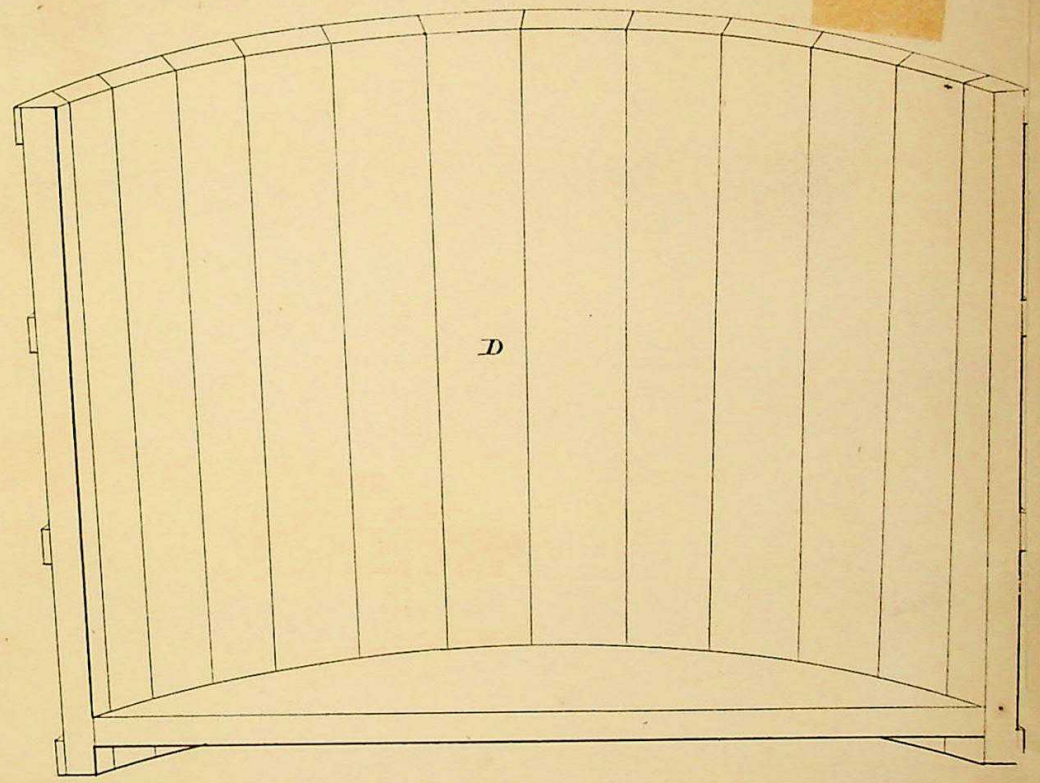


FIG. 5.



A. D. 1859, EC. 1, + 2775.
SIMONET DE CHANGY'S PROVISIONAL SPECIFICATION.

he drawing left with Provisional Specification is partly colored.

Drawn on Stone by Malby & Sons

FOODS AND BEVERAGES
426-20
1859
RECORDED

A.D. 1859, 7th DECEMBER. N° 2775.

Manufacture of Bread, &c.

LETTERS PATENT to Charles Constant Simonet de Changy, of Boulogne-sur-Mer, in the Empire of France, for the Invention of "IMPROVEMENTS IN THE MANUFACTURE OF BREAD, WHICH IMPROVEMENTS ARE ALSO APPLICABLE IN THE PREPARATION OF DOUGH OR PASTE FOR OTHER PURPOSES."

Sealed the 17th April 1860, and dated the 7th December 1859.

PROVISIONAL SPECIFICATION left by the said Charles Constant Simonet de Changy at the Office of the Commissioners of Patents, with his Petition, on the 7th December 1859.

I, CHARLES CONSTANT SIMONET DE CHANGY, of Boulogne-sur-Mer, in the Empire of France, do hereby declare the nature of the said Invention for "IMPROVEMENTS IN THE MANUFACTURE OF BREAD, WHICH IMPROVEMENTS ARE ALSO APPLICABLE IN THE PREPARATION OF DOUGH OR PASTE FOR OTHER PURPOSES," to be as follows:—

Till now, dough for bread-making has been only made with pure cold or luke warm water added to the flour. No one has thought of communicating to the water qualities which would render it more fit than it now is for the use to which it is applied. The usual manner of making dough has the disadvantage of not developing in the flour all the nutritive qualities it contains; pure water not having the necessary properties to cause this developement, the gluten is not dissolved, and the fermentation dissolves only a small portion of it in consequence of the little time it acts on the flour; it passes then partially into the

stomach in the state of inert matter without benefit for nutrition, because, when once it has undergone the action of the oven it does not further dissolve, even by the digestive juices contained in the stomach.

The principle of my Invention consists in introducing in the manufacture of dough an agent which will dissolve the greater part of the gluten and other nutritive elements contained in the flour, and which ensures by this means a greater amount of more nourishing bread for a given quantity of flour. The conditions necessary are that this agent be essentially hygienic, that it be not costly, and that it facilitate digestion and assimilation to the blood of the principles contained in cereals. That which I prefer is diastase, which I obtain by infusing in water malted barley, as hereafter described. It is this aqueous product roughly filtered which I mix with flour to make dough by substituting it for the water ordinarily employed. This agent, which dissolves and renders more assimilable all or nearly all the gluten which the flour may contain, leaves nothing to be desired as to salubrity, its cost is insignificant, and the quantity to introduce in the flour is very small. Independently of the above properties of developing the greater quantity of the nutritive principles contained in the flour of cereals, and thus aiding, by a digestion rendered more easy, their assimilation to the blood, it possesses the immense advantage of causing the flour to produce a considerably larger quantity of bread than that obtained by the ordinary processes. The quantity obtained is always subordinate to the purity and quantity more or less of foreign matters, fecula, vegetable, &c. mixed with the flour of wheat or other cereals.

I make use of four utensils which are formed as shown by the Drawing. Figure 1 represents a vertical elevation of a wooden tub with its cover; Figure 2, a section of the same without the cover; Figure 3, an elevation of a boiler; Figure 4, an elevation of a cistern of reserve, its cover not being represented; Figure 5, a section of the same; Figure 6, an elevation of a floating thermometer; Figure 7, a stirrer for agitating the mixture. The same letters indicate the same parts in the various Figures.

A, Figures 1 and 2, is a wooden tub with moveable false bottom *b* raised a short distance from the bottom; the capability of moving the false bottom is for the purpose of facilitating cleansing. The false bottom is pierced with holes of a size such that the substance to infuse may be retained and roughly filtered. The tub A should be of a wood which will not color the infusion, nor communicate to it any bad taste; B is the cover which is put in its place to retain the heat; b^1 is a discharge cock. C, Figure 3, represents an ordinary copper boiler, tinned by preference, with or without discharge cock. D, Figures 4 and 5, represents a cistern, which is also provided with a discharge cock *d*, and

capable of containing the whole of the infusion. This cistern should be as the tub A, of a wood which will not color the infusion, nor communicate to it any bad taste; it is provided with a cover to retain the heat, or to permit the gradual cooling of the infusion. E, Figure 6, represents a floating thermometer for the purpose of regulating the heat. F, Figure 7, is a stirrer with longitudinal openings to agitate the mixture.

Suppose about 220 lbs. (100 kilogrammes) of flour is to be made into bread. First, I warm in the boiler C about 44 pints (25 litres) of water, which I raise to the temperature of about 65 degrees centigrade. I place in the double bottomed tub A about 4½ lbs. (2 kilogrammes) of crushed malted barley, upon which I pour this hot water and I agitate it during several minutes with the stirrer F to soak it completely; I leave it then to macerate during about an hour after having covered the tub A with its cover B. Second, I warm another similar quantity to about 95 degrees centigrade, and I add it to the infusion which is already in the tub A; I agitate it and leave it all to macerate for about 3 hours after having covered the tub. When this time has passed I withdraw by the discharge cock b^1 the aqueous part roughly filtered, and I decant it into the cistern of reserve D. Third, I warm a third quantity of about 44 pints (25 litres) of water to about 80 degrees centigrade and pour it upon the barley left in the tub A. I agitate it as for the previous operations and leave it to macerate for about an hour, after which I withdraw by the discharge cock b^1 this last infusion, which I add to the two preceding in the reserve cistern D; I wait till this infusion descends to about 25 or 30 degrees centigrade (the temperature of water usually employed for making dough), and it is with this liquor that I knead the dough, as is done with ordinary water without changing in any manner the usual proceedings, such as the employment of yeast, kneading heat of the ordinary oven, &c.

I would remark that the waste of water inherent to the operations, and the absorption by the malted barley reduce the 132 pints (75 litres) of water employed with the infusions to about 128½ pints (73 litres) of liquor obtained, which is more than sufficient for the given quantity of flour. It will be understood that the quantity of liquor thus prepared which will enter into the manufacture of the dough is subordinate to the quality of the flour employed and to the ordinary usages. This process may be applied not only to the manufacture of bread, but also to the manufacture of other alimentary or industrial compounds, in which the flour of cereals forms the base.

After having described the nature of my Invention, and the best manner I am acquainted with for carrying it into effect, I desire it to be perfectly understood that I do not limit myself to the employment only of the diastase con-

tained in malted barley, but that I have only instanced this substance as an example, and as uniting to my knowledge in the highest degree the desired conditions of salubrity, efficacy, and economy. But I desire it to be understood that the improvements consist in introducing into flour at the time of its conversion into dough the proper agent to dissolve the greater part of the nutritive principles which are therein contained.

That further I do not wish to confine myself exclusively to the proportions which I have given as the best, as an analogous result, although less advantageous, may be obtained by varying these proportions.

That further, the means indicated and the apparatus represented in the accompanying Drawings may also be modified for the treatment of the malted barley and the preparation of the diastase, because, properly speaking, it is not this preparation, but its novel application to the above purposes, which constitutes the object of the present demand.

That, lastly, the improvements relate to the application of the same processes to the preparation of alimentary or industrial doughs and compounds, having for basis the flour of cereals.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said Charles Constant Simonet de Changy in the Great Seal Patent Office on the 6th June 1860.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, CHARLES CONSTANT SIMONET DE CHANGY, of Boulogne-sur-Mer, in the Empire of France, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Seventh day of December, in the year of our Lord One thousand eight hundred and fifty-nine, in the twenty-third year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Charles Constant Simonet de Changy, Her special licence that I, the said Charles Constant Simonet de Changy, my executors, administrators, and assigns, or such others as I, the said Charles Constant Simonet de Changy, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVEMENTS IN THE MANUFACTURE OF BREAD, WHICH IMPROVEMENTS ARE ALSO APPLICABLE IN THE PREPARATION

OF DOUGH OR PASTE FOR OTHER PURPOSES," upon the condition (amongst others) that I, the said Charles Constant Simonet de Changy, my executors or administrators, by an instrument in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said Charles Constant Simonet de Changy do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof, that is to say :—

Till now dough for bread-making has been only made with pure cold or lukewarm water added to the flour; no one has thought of communicating to the water qualities which would render it more fit for the use to which it is applied. The usual manner of making dough has the disadvantage of not developing in the flour all the nutritive qualities it contains. Pure water not having all the properties necessary to cause this developement, the gluten is not dissolved, and the fermentation dissolves only a small portion of it, in consequence of the little time it acts on the flour; it passes then partially into the stomach in the state of inert matter, without any benefit for nutrition, because when once it has undergone the action of the oven, it does not further dissolve, even by the digestive juices contained in the stomach.

The principle of my Invention consists in introducing in the manufacture of dough an agent which will dissolve the greater part of the gluten and other nutritive elements contained in the flour, and which will ensure a greater amount of more nourishing bread for a given quantity of flour. The conditions necessary are, that this agent be essentially hygienic, that it be not costly, and that it facilitate digestion and assimilation to the blood. That which I prefer is diastase, which I obtain by infusing in water malted barley, as hereafter described. It is this aqueous product, roughly filtered, which I mix with flour in the making of dough by substituting it for water. This agent, which dissolves and renders more assimilable all or nearly all the gluten which the flour may contain, leaves nothing to be desired as to salubrity, its cost is insignificant, and the quantity to introduce in the flour is very small. Independently of the properties above described of developing the greater quantity of the nutritive principles contained in the flour of cereals, and thus aiding, by a digestion rendered more easy, their assimilation to the blood, it possesses the immense advantage of causing the flour to produce a considerably larger quantity of bread than that obtained by the ordinary pro-

cesses. The quantity obtained is always subordinate to the purity and quality of the flour employed, and to the quantity, more or less, of foreign matters, vegetable fecula, &c., mixed with it.

I make use of utensils which are formed as shown by the Drawing, Figures 1 to 7. Figure 8 represents a modification, which I will describe hereafter.

Figure 1 represents a vertical elevation of a wooden tub with its cover; Figure 2, a section of the same, without the cover; Figure 3, an elevation of a boiler; Figure 4, an elevation of a cistern of reserve, its cover not being represented; Figure 5, a section of the same; Figure 6, an elevation of a floating thermometer; Figure 7, a stirrer for agitating the mixtures. The same letters indicate the same parts in the various Figures.

A, Figures 1 and 2, is a wooden tub, with moveable false bottom *b* raised a short distance from the bottom; the capability of moving the false bottom is for the purpose of facilitating cleansing. This false bottom is pierced with holes of a size such that the substance to infuse may be retained, and roughly filtered. The tub A should be of a wood which will not color the infusion, nor communicate to it any bad taste. Oak has been found to answer well. B is the cover, which is put in its place to retain the heat; b^1 is a discharge cock. C, Figure 3, represents an ordinary copper boiler, tinned, by preference, with or without discharge cock. The capacity of these two receivers A and C should not be less than a fifth greater than the quantity of water necessary to make bread of a given quantity of flour. D, Figures 4 and 5, represents a cistern, which is also provided with a discharge cock *d*, and capable of containing the whole of the infusion. This cistern should be, as the tub A, of a wood which will not color the infusion, nor communicate to it any bad taste. It is provided with a cover to retain the heat, or to permit the gradual cooling of the infusion. E, Figure 6, represents a floating thermometer, for the purpose of assisting regulation of the heat. F, Figure 7, is a stirrer with longitudinal openings to agitate the mixtures.

Suppose about 220 lbs. (100 kilogrammes) of flour is to be made into bread. Firstly, I warm in the boiler C about 44 pints (25 litres) of water, which I raise to the temperature of about 65 degrees centigrade. I place in the double-bottomed tub A about $4\frac{1}{2}$ lbs. (2 kilogrammes) of crushed malted barley, upon which I pour this hot water, and I agitate it during several minutes with the stirrer F, to soak it completely. I leave it then to macerate during about an hour, after having covered the tub A with its cover B. Secondly, I warm another similar quantity of water to about 95 degrees centrigrade, and I add it to the infusion which is already in the tub A. I

agitate it, and leave it all to macerate for about 3 hours, after having covered the tub. When this time has passed I withdraw, by the discharge cock b^1, the aqueous part roughly filtered, and I decant it into the cistern of reserve D. Thirdly, I warm a third quantity of about 44 pints (25 litres) of water to about 80 degrees centrigrade, and pour it upon the barley left in the tub A. I agitate it as for the previous operations, and leave it to macerate for about an hour, after which I withdraw, by the discharge cock b^1, this last infusion, which I add to the two preceding in the reserve cistern D. I wait till this infusion descends to about 25 or 30 degrees (the temperature of water usually employed for making dough), and it is with this liquor that I knead the dough, as is done with ordinary water, without changing in any manner the usual proceedings, such as the employment of yeast, kneading, heat of the ordinary oven, &c.

I would remark that the waste of water inherent to the operations, and the absorption by the malted barley, reduce the 132 pints (75 litres) of water employed with the infusions to about 128½ pints (73 litres) of liquor obtained, which is more than sufficient for the given quantity of flour. The grain resting upon the false bottom is submitted to pressure to extract the liquid which it may yet contain. It will be understood that the quantity of liquor thus prepared, which will enter into the manufacture of the dough, is subordinate to the quality of the flour employed, and to the ordinary usages.

This method of making the liquor has given me good results, realized upon a small scale, but it presents some inconveniences which in a manufacture upon a larger scale might become serious. Thus, the liquor is necessarily made each day for the purpose of preserving it at the convenient temperature for bread-making, it should be for this reason employed upon the spot, and cannot be easily transported, but at considerable expense in consequence of the quantity of liquid necessary for making bread ; it presents in its simple state but one degree of strength or of saturation, which could not be increased according to the nature of the flour, and of its greater or less purity. With regard to the utensils employed. The discharge cock is sometimes choked with particles of matter forced through the false bottom by water introduced at the upper part of the tub. Lastly, the barley, forming a sort of mat or thick stratum, is incompletely saturated or soaked by the water. I have been able to ascertain further, that for each quantity of about 1¾ pints (1 litre) of water employed for the manufacture of bread is required from a minimum of about 309 grains (20 grammes) to a maximum of about 463 grains (30 grammes) of barley. For biscuit, these figures should be raised to a minimum of about 618 grains (40 grammes), and a maximum of about

927 grains (60 grammes). When the above quantities have been exceeded, the manufacture of bread leaves something yet to be desired. In flour wanting in gluten the diastase acts upon the amylaceous matters, and the crumb of the bread becomes heavy, and loses its elasticity and its quality.

Figure 8 represents a modification of the apparatus previously described, and the object of which is to remedy the inconveniences which I have just pointed out.

The tub A is of the same nature as that above described, it has likewise a moveable bottom *b* and a discharge cock b^1, but this discharge cock is arranged to receive a tube *c* which screws upon the said cock and rises along the exterior surface of the tub. It is held in place by a guide *d* and provided at its upper part with a funnel *e*, into which is poured the water. The water thus introduced by the bottom relieves the grain, clears the holes in the false bottom which might be choked, and drives the air through the mass, at the same time that it divides the grain soaks or penetrates it more easily. The simple liquor, that is to say, that which has but one degree of strength or saturation, presents inconveniences in practice because it is impossible to regulate instantly the strength of the liquor according to the quality of the flour. I have therefore had recourse to a tenfold concentration of the liquor, as will be described hereafter. The liquor concentrated to the tenth degree is then ten times stronger in diastase that the simple liquor previously employed, that is to say, in place of making the infusion of about 309 grains (about 20 grammes) of malted barley to about $1\frac{3}{4}$ pints (1 litre) of water, I make it of about 7 ounces (about 200 grammes) to about $1\frac{3}{4}$ pints (1 litre). I further reduce the three infusions to two of equal quantity of water, the first heated to 60 degrees centigrade, the second to 90°, which gives a mean of 75°. Lastly, the residue of the infusions should be submitted to pressure to extract from it the remaining liquor. Any juice press being convenient for this operation, it is unnecessary to give a drawing of one.

In consequence of this modification, the preparation of the concentrated liquor is made as follows:—I will suppose that it is desired to make about 176 pints (1 hectolitre) of liquor concentrated to the tenth degree or ten times stronger or more saturated than the simple liquor already described. I warm to 60 degrees centigrade, about 176 pints (100 litres) of water, and after having placed on the false bottom of the tub about 44 lbs. (20 kilogrammes) of malted barley, I pour in by the funnel *e* about 88 pints (50 litres) or the half of the water warmed. I stir during several minutes with a stirrer, and I cover the tub which I enclose in a padded case to prevent the waste of heat. About half an hour after the 88 pints (50 litres) remaining upon the fire in the boiler have risen to 90°, I pour that in the same manner, I stir during

several minutes, I re-cover the tub and enclose it as above. I leave the whole to macerate for about 4 hours, taking care to stir a third time at the least an hour before withdrawal. The whole operation lasts then from about 4 hours and a half to 5 hours, at the end of which time the 176 pints (100 litres) contained in the tub are at once emptied by the discharge cock b^1, from which the tube *c* has been withdrawn, with the funnel which served for the introduction of the water. When the residue is well drained by the cock left open for this purpose, it is pressed whilst hot to extract from it the greatest possible quantity of liquor. The liquor having a degree of strength 10 times greater than is necessary for ordinary purposes, it is diluted with a greater or less quantity of pure water according to the different degrees of strength required, and I have arranged for this purpose the following table to serve as guide in most cases. I would remark that these proportions have appeared to me the best, but that I do not intend to confine myself to them exclusively.

The following table indicates the quantities of water to add to the liquor made with about 7 ounces (about 200 grammes) of barley to about $1\frac{3}{4}$ pints (1 litre) of water to reduce the said liquor to different degrees of strength according to the nature and purity of the flour:—

Grains.	Liquor. (Pints.)	Water. (Pints.)	Total.	Grains.	Liquor. (Pints.)	Water. (Pints.)	Total.	Liquor. (Pints.)	Water. (Pints.)	Total.
309	$1\frac{3}{4}$	$15\frac{3}{4}$	$17\frac{1}{2}$	309	$10\frac{1}{2}$	$94\frac{1}{2}$	105			
339	„	14	$15\frac{3}{4}$	339	$12\frac{1}{4}$	$92\frac{3}{4}$	„			
386	„	$12\frac{1}{4}$	14	386	14	91	„			
432	„	$10\frac{1}{2}$	$12\frac{1}{4}$	432	$15\frac{3}{4}$	$89\frac{1}{4}$	„			
509	„	$8\frac{3}{4}$	$10\frac{1}{2}$	509	$17\frac{1}{2}$	$87\frac{1}{2}$	„			
618	„	7	$8\frac{3}{4}$	618	21	84	„	14	56	70
772	„	$5\frac{1}{4}$	7	772	$26\frac{1}{4}$	$78\frac{3}{4}$	„	$17\frac{1}{2}$	$52\frac{1}{2}$	„
1018	„	$3\frac{1}{2}$	$5\frac{1}{4}$	1018	35	70	„	$22\frac{3}{4}$	$47\frac{1}{4}$	„
1544	„	$1\frac{3}{4}$	$3\frac{1}{2}$	1544	$52\frac{1}{2}$	$52\frac{1}{2}$	„	35	35	„

This process may be applied not only to the manufacture of bread, but also to the manufacture of other alimentary or industrial compounds in which the flour of cereals forms the base.

Having thus described the nature of my Invention, and the best manner I am acquainted with for carrying it into effect, I desire it to be perfectly understood that I do not limit myself to the employment of the diastase obtained from malted barley as obtained by the means herein-before described, and which I consider advantageous, as such may be varied, and I have only

instanced this substance as an example, and as according to my experience, uniting in the highest degree the desired conditions of salubrity, efficacy, and economy.

And I would further wish it to be understood, that I do not confine myself to the different proportions given, as these may be varied; and further, the means indicated and the apparatus represented in the accompanying Drawing may also be modified for the treatment of the malted barley and the preparation of the diastase; but what I claim is, introducing into the flour at the time of its conversion into dough diastase, or such like agent, to aid in the dissolving of the nutritive principles therein contained.

Also I claim the application of these processes to the preparation of dough and other alimentary or industrial compounds having flour as their base.

In witness whereof, I, the said Charles Constant Simonet de Changy have hereunto set my hand and seal, this Twenty-eighth day of May, in the year of our Lord One thousand eight hundred and sixty.

CHARLES CONSTANT SIMONET DE CHANGY. (L.S.)

Witness,

W. HAMILTON,

(L.S.) H. B. M. Consul at Boulogne, S. M.

LONDON:
Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1860.